The COS-Rocketeer

The Official Journal of the Colorado Springs Rocket Society (COSROCS)

NAR Section #515

2002 LAC Award Winner!

Volume 17, Issue 1-6 January-December 2006

Cheyenne Mountain Team wins Boeing Teamwork Award at the Team America Rocketry Challenge (TARC) National Finals May 2006.

L-R team members: Tanner Greimann, Jacob Pfund, Noelle Ridlehuber. Photo courtesy Jeff Lane.

Disclaimer: Most of the inputs for this issue were received in email form. Some of the launch logs were compiled from handwritten cards and logs, and were hard to read as a result. The editor did his best to decipher them and apologizes for any inadvertent errors.

Inside this issue:

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The COS-Rocketeer is the official journal of the Colorado Springs Rocket Society (COSROCS), NAR section #515. This journal, published bi-monthly by members of COSROCS, serves to provide information on all aspects of rocketry. Articles, rocket plans, and photos are always welcome. Items for publication should be submitted to the editor:

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COSROCS' membership dues are $20.00 per year per family. Junior memberships (under age 18) cost $5.00 per year. Checks should be made payable to COSROCS. Applications and payment should be mailed to the following address:

COSROCS
P.O. Box 15896
Colorado Springs, CO 80935-5896

The COSROCS phone number is (719)575-0060

If you have access to the Internet, COSROCS has a web site and a listserv. The COSROCS web site is:
http://www.cosrocs.org.

The e-mail address for the listserv is cosrocs@yahoogroups.com. To subscribe to the listserv, go to http://www.yahoogroups.com to register and select COSROCS.

COSROCS is a family-oriented club. Everyone is always welcome at our launches and meetings. Please join us. You'll have a blast!

COSROCS received the NAR's LAC Award (Rockwell Trophy) in 2000 and 2002 for having produced the best NAR Section newsletter.

COSROCS Officers (2006)

President:	Dave Virga, virga@datawest.net
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Secretary:	Nadine Kinney, photos.by.nadine@pcisys.net
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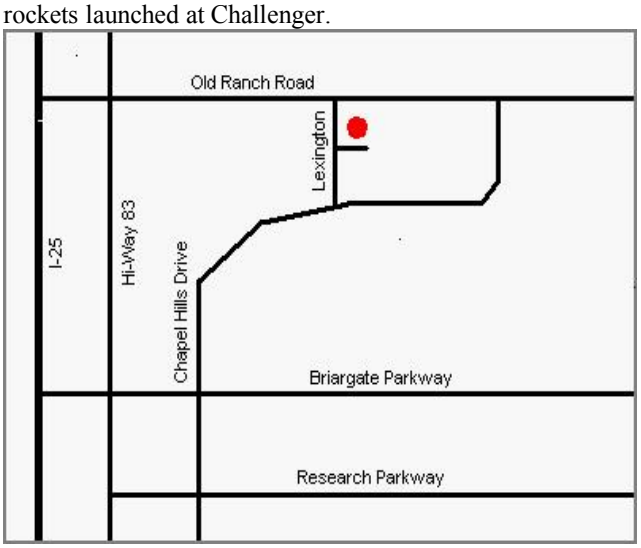
Librarian:	Dave Virga, virga@datawest.net
Contests:	Greg Elder, gelder@pcisys.net
Web Master:	Mark James, markjames@pcisys.net

Launches and Meetings

COSROCS holds a business meeting on the second Wednesday of every month from 7:00PM until 9:00PM. The meeting location is the Gold Hills Police Station at 705 South Nevada Ave., Colorado Springs.

COSROCS holds a sport launch on the second Saturday of each month, weather permitting. The launch is held at the Challenger Middle School, located at Lexington Blvd. in Colorado Springs. The launches begin at 9:00AM and last until approximately 12:00 noon. Our launches are free and open to the public. A one pound weight limit is imposed for rockets launched at Challenger.



COSROCS holds a sport launch on the fourth Saturday of each month at Cape Preble in Peyton, Colorado. The launches begin at 9:00AM. This launch site has a 3.3 pound weight limit for rockets. To get to this launch site, head east on Hwy 24 towards Peyton. Turn left on Peyton Highway, right after the little grocery store. After the curve, bear right onto north bound Peyton Hwy. Drive to Sweet Road, 4th turn on the right. Go approx 2 1/4 miles on Sweet road. On the left, near the bottom of the hill, is a gate to the launch site (21410 Sweet Road). Look for the green ranch gate.

The Nagging Editor

By Tom Dembowski

I ask for your help to have something to put in each issue. Whenever there is an event, please just shoot me a few lines and/or a picture to include. And please submit it in some sort of common file format (word etc). I have had excellent articles submitted in formats I (and others) could not open no matter how hard we tried. Keep it simple please.

Appreciate all those who did send me articles to use in the newsletter. Thanks in advance for your help and keep those articles and pictures coming!

You will notice launch logs are back in this issue. With Warren's help, I was able to locate them. We will continue to publish them now and in future issues.

"It Takes A Club"

By Dave Virga, COSROCS President (2006)

Hello COSROCketeers,

Looking back on 2006, we had a really great year! Our club had some solid growth in a number of key areas. We re-established our rapport with Tripoli Colorado, and initiated joint Spring and Fall launch collaborations at T-C's Hartsel site. We hosted record numbers of Scouts (Cub, Boy and Girl), schools, Civil Air Patrol, Federation of Galaxy Explorers, and 4-H groups. We laid the groundwork for a new, full-featured launch control system. We revamped our web site. We worked with nearly a dozen Team America Rocketry Challenge teams, one of which even went to the national finals. We're doing a lot of things right, and we have a lot to be proud of!

We accomplished more last year than I ever dreamed that we could. The key to the successes is you, the club members. We had several new members step up and offer their time and resources for club projects. This is the single most important area of growth; active members are the lifeblood of any organization. It takes a club - the entire club - to run a rocketry program in a city as large as Colorado Springs; if just ten more people spend a couple of hours a month helping the club, we will see even more amazing accomplishments!

Finally, I ask that you remember why we are here. Our mission is to promote safe sport rocketry, and to inspire tomorrow's engineers, scientists and astronauts. The more you do, the more we all benefit. Pay forward!

Section News

New 2-Stage Rocket Rips Its Way Skyward

COLORADO SPRINGS, Colo. (November 18, 2005) - DynaStar Mid-Power Model Rockets announced today the release of a new kit, the "Rip-Roar." The Skill Level 3 rocket can be flown as a single or two-stage configuration, and is capable of flying over 1500 feet on "D"-size black powder rocket motors. It comes with colorful flame-graphics, a large 32 inch diameter parachute, and metal engine hooks that allow engines to be swapped out in seconds between flights. The instructions are loaded with high quality illustrations, hallmark of the DynaStar line of kits, which makes them easy and pleasurable to assemble. This rocket (2.2 inches in diameter, and 28.5 inches tall) is unique in that the booster stage tumbles to the ground, and doesn't need a separate recovery device. This is practically unheard of with such a big rocket. For more information, visit www.dynastar-rockets.com

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Cheyenne Mountain Team Rockets to Success

By Jeff Lane

About 10,000 middle and high school students participated in last year's contest, which was sponsored by the Aerospace Industries Association and the National Association of Rocketry. The Defense Department and NASA are both government partners in this year's competition, the fifth year of the Team America Rocketry Challenge.

100 teams flew at last year's finals, and the Cheyenne Mountain team placed 48th. The team's final competition flight was an aberrant 50 feet too high, but the parachute ejected beautifully at apogee. The team had 3 test flights the previous day and if they'd been able to maintain consistency, would have scored in the top 20.

The teens learned a lot and are better prepared this year to place in the top ten; they won the Boeing Teamwork award at the national finals. They worked together and had tremendous fun doing it, which was obvious to the judges. The prep and setup was much more complex than average because of the tube launch system compared with the rods most teams used, and each team member worked efficiently and cheerfully to launch successfully.

This year's student team members include Jacob Pfund,Tanner Greimann, and Noelle Ridlehuber. Jacob said the most difficult problem to overcome, was achieving repeatable performance. The best part about this contest, said Tanner, is hands-on experience attempting to hit precision goals with real aerospace tools and materials. The team uses materials from local (Penrose) model rocket company Estes, and designs the rockets with software from local company Apogee.

The contest requires that students design, build and test a model rocket that can fly for as close to a 45 second total flight duration as possible while reaching an altitude of 850 feet. The rocket must also return one raw egg back to the ground unbroken.

Team supervisor Jeff Lane said, "The contest is an excellent opportunity for students to learn hands-on lessons in aerodynamics. Participants apply concepts like computing trajectory and eliminating drag to their models and see the results immediately... there's a deep satisfaction in knowing things you have learned are helping launch something into the sky; this brings these concepts home to the real world for the students."

"The project had the team building rockets in a manner not too far off from professionals. The contest promotes teamwork, delegation of tasks and group decisions", Lane said.

Note: This is an edited version of an article Jeff submitted for Your Hub in Sept 2006.

Submitted by Warren Layfield

What are Black Holes Anyway?

Black holes are not really holes at all. They are the opposite of empty! Black holes have the most matter stuffed into the least space of any objects in the universe. Because they are so compact, they have very strong gravity.

Here on Earth, gravity is what makes things fall down, rather than just float away, when you let go of them. Gravity is what you are measuring when you step on a scale to weigh yourself. Your weight is the amount of force that Earth's gravity exerts on you. The more matter your body contains, the more you weigh. Likewise, the more matter an object has, the stronger its gravity.

The gravity of a black hole is so strong that not even light can escape. Even if a bright star is shining right next to a black hole, you cannot see the black hole. Instead of reflecting the light as other objects do, the black hole just swallows the starlight forever. Any matter that gets too close to a black hole gets swallowed up as well.

There are at least two kinds of black holes.

One kind is called a stellar-mass black hole. You can think of it as a "one-big-star" black hole. This type of black hole forms when a big star burns up all its fuel and explodes (called a supernova). Then what's left collapses into a super-compact object—a black hole. Stars must contain quite a bit more matter than our Sun for this to happen. So our Sun, and most stars, will never become black holes.

Stellar-mass black holes are only a few tens of kilometers across—maybe about 40 miles. Just imagine. Our Sun is so huge that about one million Earths would fit inside it. A star with enough matter to become a black hole contains maybe 10 times as much matter as the Sun. Now imagine a star with that much matter, shrinking into a space no farther across than the distance you can drive a car in less than one hour!

A black hole with all the mass of Earth would be about the size of a fingernail!

Another kind of black hole is called a supermassive black hole. You can think of this type as a "million-big-star" black hole, because it contains as much matter as one million to 100 million Suns! Astronomers think that supermassive black holes are lurking at the centers of galaxies, including our own Milky Way galaxy. They don't know yet how these humongous black holes are formed.

Learning More About Black Holes

Scientists really want to learn more about black holes and other strange and massive objects in the Universe. Two space missions are helping them do just that.

One is a space telescope called **XMM-Newton**. It was launched into Earth orbit in 1999 by NASA and the European Space Agency. It observes the universe in high-energy x-rays, a type of light that we can't see with our eyes. Matter, such as gas and dust particles, near black holes puts out x-rays as it swirls around at light speed just before the black hole swallows it up. By observing these x-rays, XMM can help scientists understand the black hole.

Another mission that will study black holes is **LISA**, which stands for Laser Interferometer Space Antenna. (Thank goodness for abbreviations!) NASA plans to launch LISA in 2015. LISA's three spacecraft will form a triangle 5 million kilometers (that's about 3 million miles) on each side. This spacecraft triangle will orbit the Sun just like Earth does, but the LISA spacecraft will tag far behind Earth in its journey around the Sun. LISA's three spacecraft will be "connected" by laser beams to make a giant virtual antenna.

What will LISA be looking for?

These are ripples in space-time itself that occur when massive objects such as black holes move through space. No one has ever detected a gravitational wave before, but scientists are almost 100% certain they exist. But gravitational waves are very weak. LISA will have to be extremely sensitive and have very advanced technology to detect them. LISA will help

scientists, and the rest of us, understand black holes and other massive objects in the Universe.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

COSROCS Items for Sale

COSROCS Pins. The COSROCS pins are still in. They look great. The pins have the COSROCS logo and a 1, 2, or 3 on them to indicate your certification level. Pins without a certification level are also available. The cost per pin is $5. Contact Warren Layfield if you want to purchase one.

Alpha Anarchy – Promoting Competition Rocketry with Fun Contests

Submitted by Greg Elder

The number of people that participate in NAR contests is fairly small. I've heard anecdotal comments from other NAR members that only 2-5% of rocketeers compete in contests. Whenever we host a NAR contest, I'm always concerned that we may not get the minimum number of participants required to sanction the event. (We usually do get enough people, but not by much.) Below are some of the comments I've received from club members that don't participate in contests:

- Competition rocketry is too hard; it's too difficult to build a rocket that can win an event
- Competition rocketry is too expensive; you need to build so many different types of rocket and have multiples of each type in order to have a chance at winning anything
- It takes too much time to prepare for a contest
- How can I, as a beginner, have any chance in a contest against experienced competitors who have spent years competing and perfecting their performance?

All of the above comments are true to some degree. However, if we could just encourage people to give competition a try, some of them might discover how fun it can be. And if they find competition rocketry to be fun, they'll hopefully participate in future contests.

Over the years, COSROCS has held various fun contests. A fun contest is a way to give people a feel for competition rocketry without the need for specially designed rockets or costly competition-specific motors. To level the playing field, our fun contests specify the model rocket that must be used for the events. While we don't use exact NAR rules for the fun contests, we do keep the rules as similar as possible.

One of our previous fun contests had been the Big Bertha Blast, where all events used Estes Big Berthas. Our most recent fun contest was held on July 22, 2006 and was called Alpha Anarchy. For this contest, all events had to be flown using Estes Alphas. (As Alphas are popular model rockets, most club members already had an Alpha available for the contest. For those members without an Alpha, one could be purchased at local hobby stores and be built in a day.) Below are the contest rules.

Alpha Anarchy Rules

1. Each flight must use an Estes Alpha rocket. (This can be any Alpha model that Estes has produced over the years.) You may substitute whatever parachute and streamer you desire to use with your Alpha for the events.

2. You must use the same rocket for each event, i.e., you cannot use different/multiple Alphas. If you lose or destroy your Alpha during an event, you are DQ'ed from any remaining events you have not flown.

3. All flights must be returned.

4. You are allowed only one flight per event.

5. The three events for this contest are:

   a. Alpha Parachute Spot Landing - Using any NAR certified motor and a parachute for recovery, land your Alpha closest to a spot established by the Contest Director. This must be the first event you fly.

   b. Alpha A Parachute Duration - Using any NAR certified A motor and a parachute, keep your Alpha aloft for the longest duration.

   c. Alpha B Streamer Duration - Using any NAR certified B motor and a streamer, keep you Alpha aloft for the longest duration.

6. NAR scoring will be applied for the different places in the events. Points will be awarded in each event as follows: 10 points for first place, 6 points for second place, 4 points for 3rd place, 2 points for 4th place, and 1 point for a qualified flight. The weighting factors are: Spot Landing: 4, Parachute Duration: 7, and Streamer Duration: 8.

7. Entry fees for Senior members are $1 per event or $2 for all three events. The contest is free for those under 21.

Ten participants competed in Alpha Anarchy. Most of the competitors used Alpha III model rockets with the plastic fin units. However, a few folks had traditional Alphas with the balsa fins. We had two A Division participants, while the one B Division participant competed with the C Divisioners.

Alpha Parachute Spot Landing

Alpha Parachute Spot Landing was probably the easiest event—simply land your Alpha closest to a spot designated by the Contest Director. Recovery must be via a parachute. Of course, a certain amount of luck comes into play here as well. Most people used 1/2A6-2 motors. Though an easy event, everyone had a difficult time getting anywhere near the spot. In A Division, Corry Hitchner just edged out his brother Trevor by one foot (41 feet versus 42 feet). In the B/C Division, Greg Elder had the closest landing at 36 feet. Next was Jeff Lane at 63.5 feet, followed by Adam Gormley at 65 feet and Tom Dembowski at 90 feet.

Alpha Parachute Spot Landing			
Name	**Distance**	**Place**	**Points**
A Division			
Corry Hitchner	41	1	40
Trevor Hitchner	42	2	24
B and C Division			
Greg Elder	36	1	40
Jeff Lane	63.5	2	24
Adam Gormley	65	3	16
Tom Dembowski	90	4	8
Brent Williams	Too Far	5	4
Dave Virga	DQ	-	0
Warren Layfield	DQ	-	0
George Shaiffer	DQ	-	0

Alpha A Parachute Duration

In the parachute duration event, most competitors used Estes A8-5 motors. Other motors used were Estes A8-3's and Quest A6-4's. In A Division, Trevor Hitchner took first place with a 42 second flight, while his brother Corry achieved a 25 second duration. The winning flight in B/C Division swept everyone else away. Jeff Lane had a spectacular 180 second duration—more than twice the time of second place finisher Dave Virga (71 second duration). Tom Dembowski took third place with 61 seconds, followed by Adam Gormley in fourth place with 35 seconds. Three competitors had disqualified flights due to shock cord separation. (Man, those A8 motors sure pack powerful ejection charges.)

Alpha A Parachute Duration			
Name	**Time**	**Place**	**Points**
A Division			
Trevor Hitchner	42	1	70
Corry Hitchner	25	2	42
B and C Division			
Jeff Lane	180	1	70
Dave Virga	71	2	42
Tom Dembowski	61	3	28
Adam Gormley	35	4	14
Warren Layfield	20	5	7
Greg Elder	DQ	-	0
Brent Williams	DQ	-	0
George Shaiffer	DQ	-	0

Alpha B Streamer Duration

Every competitor had a qualified flight in the streamer duration event. In A Division, Trevor Hitchner beat his brother Corry by just two seconds to take first place. Jeff Lane stole the show again in B/C Division.

Alpha B Streamer Duration			
Name	**Time**	**Place**	**Points**
A Division			
Trevor Hitchner	33	1	80
Corry Hitchner	31	2	48
B and C Division			
Jeff Lane	72	1	80
Dave Virga	34	2	48
Tom Dembowski	34	2	48
Adam Gormley	32	3	32
Brent Williams	31	4	16
Warren Layfield	29	5	8
Greg Elder	25	6	8
George Shaiffer	25	6	8

Final Results

He had an outstanding flight of 72 seconds to take first place. (I don't know how he managed to pack his six foot streamer into his Alpha.) The next closest competitors were Dave Virga and Tom Dembowski. Both had times of 34 seconds—

good enough to tie for second place. Adam Gormley took third place with 32 seconds, followed by Brent Williams in fourth place with a 31 second flight.

Final Standings

Trevor Hitchner took first place overall in A Division with 174 points. Jeff Lane won B/C Division hands down with 174 points also. Second place was taken by Dave Virga with 90 points. Next was Tom Dembowski in third with 84 points and Adam Gormley in fourth place with 84 points. Adam was our only B divisioner, so he had to compete in C Division. He did quite well against those "old timers".

Alpha Anarchy Final Standings					
Name	**Spot Lnd**	**PD**	**SD**	**Total Pts**	**Place**
A Division					
Trevor Hitchner	24	70	80	174	1
Corry Hitchner	40	42	48	130	2
B and C Division					
Jeff Lane	24	70	80	174	1
Dave Virga	0	42	48	90	2
Tom Dembowski	8	28	48	84	3
Adam Gormley	16	14	32	62	4
Greg Elder	40	0	8	48	5
Brent Williams	4	0	16	20	6
Warren Layfield	0	7	8	15	7
George Shaiffer	0	0	8	8	8

A number of COSROCS members had donated prizes for the Alpha Anarchy contest. We had enough donations such that each person who participated received a prize. This proved to be a successful contest. We had five people participate that had never tried competition rocketry before. Some of them said that they are more likely to give NAR competition a try in the future. Now that COSROCS has held the Big Bertha Blast and Alpha Anarchy, can the Mean Machine Marathon be far behind? Only time will tell.

Greg Elder is the COSROCS contest director.

Launch Report Challenger MS, 20 May 06

Mark Vedra	Gnome	1/4A3-3T
Andrew Fredell	Gnome	1/4A3-3T
Nathan Postman	Gnome	1/2A3-4T
Daniel Postman	Gnome	1/2A3-4T
Dillon Johnson	Gnome	1/2A3-4T
Parker Smith	Gnome	1/2A3-4T
Tyler Gray	Gnome	1/4A3-3T
Nick Wylie	Gnome	1/2A3-4T
Rew Woodbury	Gnome	A10-3T
Nicholas Carlson	Gnome	1/2A3-4T
Eric Fedastion	Gnome	1/2A3-4T
Ian Bullard	Gnome	1/2A3-4T
Jordan Green	Gnome	1/4A3-3T
Kobey Morgan	Gnome	A3-4T
Caleb Kimble	Gnome	1/2A3-4T
Braden Milfalusy	Gnome	1/2A3-4T
Aaron Mauffray	Gnome	1/4A3-3T
William Shambach	Gnome	1/4A3-3T
Jack Woodbury	Gnome	A10-3T
Wade Woodbury	Gnome	1/2A3-4T
Jackson Mitchell	Gnome	1/2A3-4T
Andrew Fredell	Gnome	1/4A3-3T
Sam Mitchell	Gnome	1/4A3-3T
Nick Stastra	Alpha III	B6-4
Tyler Engle	Gnome	1/2A3-4T
Keith Johnson	Gnome	1/4A3-3T
Matthew Dwyer	Gnome	1/4A3-3T
Sean Dwyer	Gnome	1/4A3-3T
Rachel Dwyer	Outlaw	C6-5
Mike Dwyer	Bandit	C6-5
Tanner Tate	Gnome	1/4A3-3T
JP Frith	Gnome	1/4A3-3T
Hannah Frith	Sm Estes Sngl	B4-4
Nico Mercurio	Gnome	A3-4T
Tyler Johnson	Gnome	A3-4T
Alex Weber	Gnome	1/4A3-3T
Tate Danivan	Gnome	1/4A3-3T
Aaron Saychek	Firestreak	A8-3
Jackson Vollmer	Gnome	A3-4T
Jackson Barton	Gnome	1/2A3-4T
Conner Woltman	Firestreak	A8-3
Dave Virga	Cosmic Cobra	B6-2
Tim Theodoseau	Buster	E28-4
Kris Theodoseau	Snitch	C6-0
Eric Tronnier	Sm Estes Sngl	A8-3
Matthew Stein	Gnome	1/4A3-3T
Michael Stein	Patriot	A8-3
Brian Vedar	Gnome	1/4A3-3T
Liam Gillody	Gnome	1/4A3-3T
Michael Stinnett	Gnome	1/4A3-3T
Eric Pannell	Gnome	1/4A3-3T
Andrew Hampson	Gnome	1/4A3-3T
Joe Gaston	Gnome	1/4A3-3T
Connor Woltman	Firestreak SST	1/4A3-3T
Alex Theodoseau	CBO-87	B6-4
Trystain D.	Gnome	A3-4T
David Jolly	Viking 7	C6-3
Trystain D.	Gnome	A3-4T
Kris Theodoseau	Snitch	C6-7
Beau Perry	Beau	B6-4

Launch Report for Peyton CO 22 July 2006

Tom Dembowski	Navy Missile	A8-3
Tom Dembowski	Alpha III test	B6-4
Randy S.	Outlaw	B6-4
Greg Elder	AMX Spitfire	D12-5
Richard	Blue Streak	C6-7
Tom Dembowski	Nova Payloader	A8-3
Brent Williams	Alpha	A8-3
George Shaiffer	Alpha	1/2A6-2
Randy S.	Outlaw	C6-3
Tom Dembowski	Cobra	3xA8-3
Dave Virga	Alpha	1/2A6-2
Jacob Pfund	IO	G77
Brent W.	Alpha	B6-4
Tom Dembowski	Alpha	1/2A6-2
Richard	Blue Ninja	D12-7
	Red Hot	F24-7
Brent W.	Spool	D12-3
Tom Dembowski	Alpha	A10-3T
Tom Dembowski	Navy Missile	C11-3
George Shaiffer	Alpha	A8-3
Randy S.	Outlaw	B6-4
Brent W.	Alpha	B6-4
Dave Virga	Alpha	A6-4
Jeff Lane	Green Worm	E18-4
Brent W	Spool	D12-3
Randy S	Outlaw	C6-5
Jacob Pfund	IO	G74
Dave Virga	Alpha	B4-4
Tom Dembowski	Alpha	B6-4
Brent W.	EZ Glider	A8-3
Randy S.	Outlaw	C6-5
Tom Dembowski	American Eagle	B6-4
Greg Elder	Alpha	A8-3
Jeff Lane	Alpha	A3-4T
Jeff Lane	Green Worm	E18-4

Launch Report for Challenger MS 12 August 2006

Joseph	Bandito	½ A3-2T
Josh	Bandito	½ A3-2T
Andy	Pencil	B4-2
Robert	RedWhiteBlue	A8-3
Jake Bandito	Bandito	½ A3-2T
Andrew	Guardian	B4-4
Jonathan D.	Golden Dart	A8-3
Michael D.	Red&Blue Msl	A8-3
James	SST Scout	A8-3
Tyler	Patriot	C6-3
Jeff Lane	Gunslinger	E30-7
Nathan Coit	Dynamic Carr	B6-4
Spancer SR 71		C6-3
Brent	Firestreak SST	A10-3T
Matthew	Bandito	A10-3T
Josh	Bandito	A10-3T
Mateo	Flash	A8-3
Tyler	Patriot	B6-4
David	Veloceptor	B6-4
David	T-Rex	B6-4
David	Sprakly rocket	B6-4
James	SST Scout	A8-3
Ernie	Ern 5	?
Nathan Coit	Paveway	B6-4
Tom D	V-2	D12-3
Dave V	EST Air Show	C6-3
Richard H.	ShadowHawk	F52-8

Launch Report for Challenger MS 11 November 2006

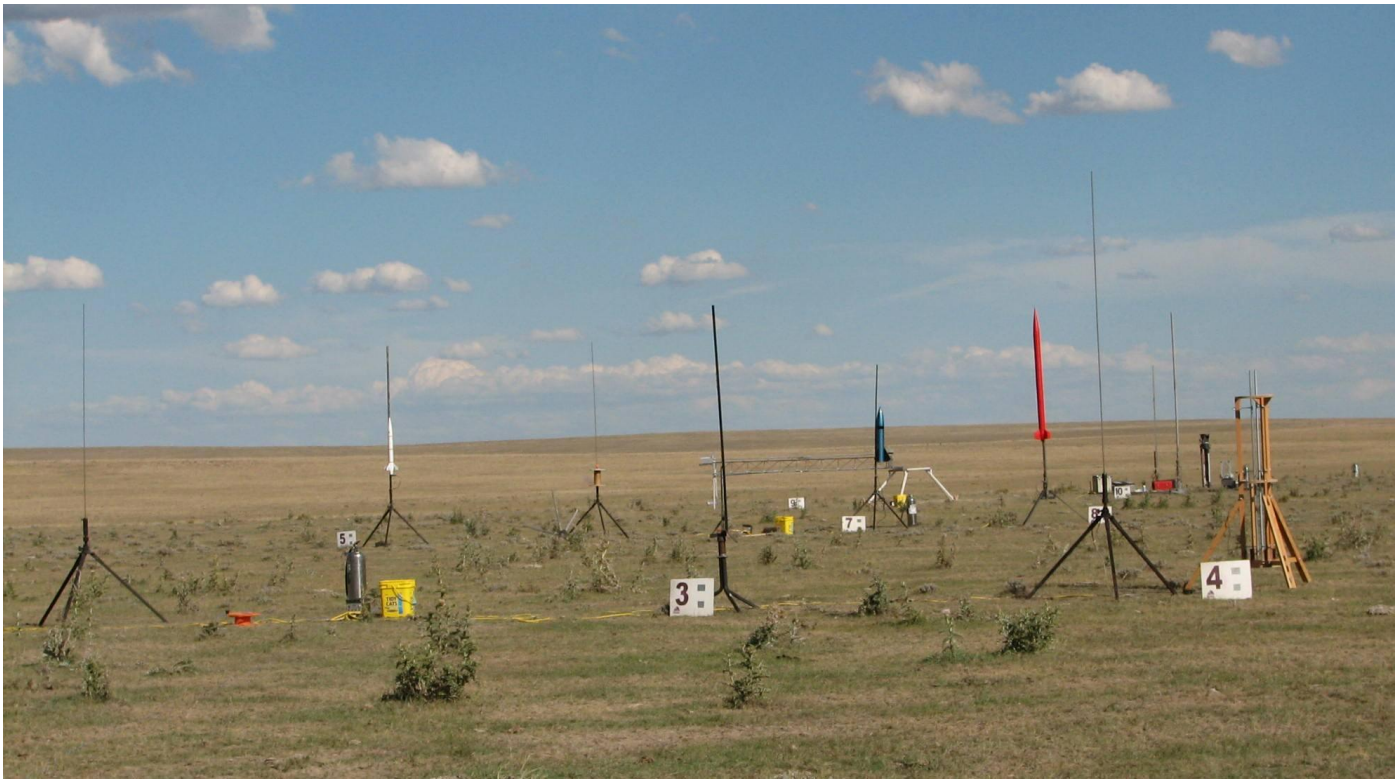
Andrew D	Chrome Dome	B6-4
Rice A	Chrome Dome	B6-4
David Mastine	Generic E2X	A8-3
Kyle Fisch	Generic E2X	A8-3
Steph Chandler	Generic E2X	A8-3
Stephen Cowen	Firestreak	A10-3T
Karl K	Yellow Hich	A10-3T
Matthew K	Black Bob	A8-3
Rally	Snow Storm	A8-3
Rally	Little Guy	A10-3T
Huckster	Generic E2X	A8-3
Jessica M	Patriot	C6-5
Tristan	Generic E2X	B6-4
Tanner B	Alpha 3	A8-3
Kyle Fisch	Generic E2X	A8-3
Steph Chandler	Generic E2X	A8-3
Kevin	USA Space	A8-3
Johnny	Generic E2X	A8-3
Frank	Bullpup	B4-4
Ryan	Generic E2X	A8-3
Sam Talarico	Nicky	B6-4
Stephen Cowen	Firestreak	A10-3T
Bart Benne	Triton X	B6-4
Raleigh B.	Little Guy	A10-3T
Johnny	Generic E2X	?
Bart Bern	Mercury Redstone	C6-5
Alex	Generic E2X	A8-3
David M	Generic E2X	A8-3
Kyle F	Generic E2X	A8-3
Mike Seymour	Generic E2X	A8-3
Raleigh Burrell	Little Guy	A10-3T
Kevin	USA	?
Jeff Lane	Eggspress	D13-3
Johnny	Generic E2X	A8-3
Bart Benne	Triton	B6-4
Alex	Generic E2X	A8-3

Les Mann helps kids build generic E2X's,
20 Aug 2006.
(Photo from Virga Archives)

Jeff Lane's too cool "Little Joe 6" paper rocket screams off the pad at Peyton.
(Photo courtesy Jeff Lane/COSROCS)

Borrowing from SLBM launch technology, testing the TARC rocket, May 2006 at Challenger MS.
(Photo courtesy Jeff Lane/COSROCS)

Spools Do Fly! Dave Virga's Spool at Octoberfest, 7 Oct 06.
(Photo by Dave Virga)



I can see for miles and miles and miles…NCR Octoberfest Launch 7 Oct 06.
(Photo courtesy the Dave Virga archives)

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